Review comments – CCSP SAP 5.1, "Use of observations .. in decision support for selected sectors and regions"

From what I can tell of the introductory material, the intent of this report is to illustrate how decision support tools in selected sectors and regions can be used to help respond to climate change. The climate change aspect is not entirely clear in the introductory material, however the inclusion in each of the chapters of a subsection indicating how the DST can help in climate change applications makes it clear that this is the main focus (as it must be, otherwise there is no point in having this material in a CCSP report). While the material describing the various DSTs, how they use data, uncertainties, etc is useful background information in each chapter, the core of this report is the various subsections 5.

NASA was the lead for this report, and the introductory material is, in my view, too NASA-centric, and too focused on satellite data. To my understanding, CCSP is an interagency activity, and assignment of the lead does not mean that the material is to be specific to that agency's programs. So the introductory material needs to be broadened. I am not nearly as concerned that some of the chapters deal with DSTs that are highly oriented toward NASA data and others are not, since it is clear that the subsections are meant to be examples, and not to be comprehensive. I do think, however, that the Executive Summary and Introduction need to be redrafted to indicate that this report is intended to illustrate how DSTs can help in adaptation to climate change.

Furthermore, I think that the individual chapters need to lay out clearly where the "pressure points" in the particular applications lie with respect to climate. At present, this treatment is somewhat uneven across the chapters. For instance, the agriculture chapter has a concise, but readily understandable, statement on the interaction of climate (and climate change) and agricultural production. The air quality chapter, on the other hand, doesn't really say anything about what the concerns related to air quality in a changing climate are, it instead states issues having to do with downscaling from GCMs, etc. The energy chapter says nothing whatever about the implications of climate change for energy, the public health section has one paragraph (which probably should be expanded somewhat), and the water chapter makes statements to the effect that water managers have been dealing with climate change for a long time, and have it under control (not really true, see below). So that aspect of the introductory material in most of the chapters needs to be revised.

The individual chapters are reasonably even in their treatment of the various topics (I greatly appreciate that the lead authors imposed a standard chapter outline on the chapter leads). One exception is the air quality chapter which goes on and on with respect to observations – that should be cleaned up. I am especially concerned, though, that the water chapter is something of a fish out of water (no pun intended). The RiverWare DST simply is not appropriate in a climate change context. As stated in Section 5, "RiverWare itself does not relay on global change information". That statement is true, and is an indication of why the RiverWare DST (alone) is inappropriate. The problem is, to address global change issues with respect to water, you have to represent the land surface

hydrologic process, as well as the effects of water management. There has been good work done on this – see in particular papers by Aris and Kosta Georgakakos written for the 2000 U.S. National Assessment. By failing to represent the hydrology, you've essentially removed the climate "pressure point", and the ability of the DST to address climate issues is minimal. So I think that this section needs to be completely rewritten, or perhaps removed. I also think that the entire tone of this chapter is misleading. Saying that water managers have been dealing with these problems for a long time is simply incorrect. What water managers have been dealing with since at least the 19th century (when the major cities of the eastern U.S. began to tap remote sources of water to mitigate disease problems) is hydrologic uncertainty. There are lots of tools that have been developed in the computer era (e.g., stochastic hydrology, optimization) for addressing hydrologic uncertainty *in a stationary climate*. It is now quite clear, however, that this fundamental assumption is untenable (Chris Milly and others are writing a paper on precisely this topic). There is now lots of evidence, for instance, establishing that western U.S. snowpacks have been declining, and as a result seasonal runoff characteristics have changed. Furthermore, these changes are not limited to the west; most of the country has been getting wetter for instance. The hydrology chapter of SAP 3.4 addresses many of these changes specifically. Unfortunately, there appears to have been minimal coordination across the 20+ SAP reports, but as a minimum it would be nice not to have completely contradictory statements. So I think that this chapter in SAP 5.1 needs to go back to the drawing board – it is far too limited, and misleading.

Aside from the problems with Chapter 5 and other issues raised above, most of the report reads reasonably well. In addition to providing more focus, it would be nice to condense the introduction, and just make it a statement of purpose for the report.